CERTIFICATION OF TRANSLATION

I, ***Hye-young Jang***, an employee of Y.P.LEE, MOCK & PARTNERS of Koryo Bldg., 1575-1 Seocho-dong, Seocho-gu, Seoul, Republic of Korea, hereby declare under penalty of perjury that I understand the Korean language and the English language; that I am fully capable of translating from Korean to English and vice versa; and that, to the best of my knowledge and belief, the statement in the English language in the attached translation of ***Korean Patent Application No. 10-2003-0049546*** consisting of 13 pages, have the same meanings as the statements in the Korean language in the original document, a copy of which I have examined.

Signed this 19th day of December 2006

Hye-young Jang

ABSTRACT

[Abstract of the Disclosure]

Provided are a disc cartridge and a disc drive apparatus. The disc cartridge includes cases that form an internal space to accommodate a disc, and a pair of elastic protrusions that are formed at both sidewalls of the cases and are elastically biased toward the internal space so that free ends of the elastic protrusions hold the disc. Surfaces are formed at the free ends to slope toward the internal space so that the disc ascends on the surfaces when the pair of elastic protrusions hold the disc and descends on the surfaces when the pair of elastic protrusions are opened.

[Representative Drawing]

FIG. 5

SPECIFICATION

[Title of the Invention]

DISC CARTRIDGE AND DISC DRIVE APPARATUS

[Brief Description of the Drawings]

FIGS. 1 and 2 show a case which is opened and closed when a disc cartridge is inserted into a disc drive apparatus, according to the prior art.

FIG. 3 is an exploded perspective view of a disc cartridge according to the present invention.

FIGS. 4A and 4B are cross-sectional views showing ascending and descending states of a disc in the disc cartridge shown in FIG. 3.

FIGS. 5 through 7 are perspective views showing steps of inserting the disc cartridge shown in FIG. 3 into a disc drive.

< Explanation of Reference numerals designating the Major Elements of the Drawings >

100: disc cartridge	101: openings
110,120: upper and lower cases	121: elastic protrusions
121a: surface	200: disc drive
210: motor hub 220: lever	

[Detailed Description of the Invention]

[Object of the Invention]

[Technical Field of the Invention and Related Art prior to the Invention]

The present invention relates to a disc cartridge accommodating a disc and a disc drive apparatus into which the disc cartridge is loaded, and more particularly, to a slot-in disc cartridge and a disc drive apparatus.

As shown in FIG. 1, slot-in refers to a way in which a disc cartridge 20 directly goes into and out of a disc drive 10 via a slot 11. As shown in FIG. 2, the disc cartridge 20 inserted into the disc drive 10 via the slot 11 goes to a position where a clamp 21 of a disc 22 is located above a motor hub 21. A shutter 20a, which has

covered an opening hole 20b, is opened by a predetermined opening and closing unit during the incoming of the disc cartridge 20. A magnet 13 installed in the motor hub 12 pulls the disc clamp 21 with a magnetic force, and thus a centering boss 12b is clamped into a cavity 21a of the disc clamp 21 so that the disc 22 rotates with the movement of the motor hub 12. Reference numeral 14 denotes a motor shaft for rotating the motor hub 12. Japanese Patent Publication No. 2001-6210 discloses a structure similar to the above-described structure.

However, as disc drive apparatuses slim, a space of the disc drives into which a disc cartridge is inserted has been reduced. Thus, a gap between the disc cartridge 20 and the motor hub 20 hardly exists. Therefore, when the disc cartridge 20 is inserted into the disc drive 10, the shutter 20a is opened. As a result, the disc 22 touches the motor hub 12 and thus is scratched by the motor hub 12.

Accordingly, a slim disc drive apparatus requires a new structure so as not to damage a disc inserted thereinto.

[Technical Goal of the Invention]

The present invention provides a disc cartridge with an improved structure so that a disc is not damaged even when the disc is inserted into a slim disc drive apparatus, and a disc drive apparatus.

[Structure and Operation of the Invention]

According to an aspect of the present invention, there is provided a disc cartridge including cases and a pair of elastic protrusions. The cases form an internal space to accommodate a disc. The pair of elastic protrusions are formed at both sidewalls of the cases and are elastically biased toward the internal space so that free ends of the elastic protrusions hold the disc. Surfaces are formed at the free ends to slope toward the internal space so that the disc ascends on the surfaces when the pair of elastic protrusions hold the disc and descends on the surfaces when the pair of elastic protrusions are opened.

According to another aspect of the present invention, there is provided a disc drive apparatus loading a disc cartridge including cases including at least a pair of elastic protrusions extending from sidewalls of the cases to support a disc on sloped surfaces formed at free ends of the elastic protrusions. The disc drive apparatus

includes a lever that clashes against the free ends of the elastic protrusions to open the elastic protrusions when the disc cartridge enters the disc drive apparatus, so as to allow the disc to descend on the sloped surfaces.

FIG. 3 is an exploded perspective view of a disc cartridge 100 according to the present invention. Referring to FIG. 3, the disc cartridge 100 includes upper and lower cases 110 and 120 therebetween which a space 122 is formed to accommodate a disc 130. The lower case 120 includes a pair of elastic protrusions 121 which are elastically biased toward the space 122 in which the disc 130 is placed. An end of each of the elastic protrusions 121 is fixed to a sidewall of the lower case 120, and the other free end of each of the elastic protrusions 121 has a surface 121a sloping toward the space 122. Thus, the edge of the disc 130 placed in the space 122 is located on the surfaces 121a of the pair of elastic protrusions 121. As a result, the disc 130 lifts in the space 122 with supported by the elastic protrusions 121 as shown in FIG. 4A. However, when the pair of elastic protrusions 121 are opened outwardly, the disc 130 slides down the surfaces 121a and then is located in the space 122 as shown in FIG. 4B. In other words, in a case where an external force is not applied to the disc 130 located in the upper and lower cases 110 and 120, the disc 130 slightly lifts up in the space 122 with supported by the elastic protrusions 121. In contrast, in an event that the elastic protrusions 121 are opened by the external force, the disc 130 slides down the surfaces 121a. The elastic protrusions 121 prevent the disc 130 from clashing against a motor hub 210 of FIG. 5 when the disc cartridge 100 goes into a disc drive. In other words, the elastic protrusions 121 allow the disc 130 to slightly lift up in the lower case 120 at ordinary times. However, when the disc 130 is completely loaded into a disc drive 200 of FIG. 5, the elastic protrusions 121 are opened so as to prevent the lower surface of the disc 130 from being scratched by the motor hub 210 in the disc drive 200. Thus, as shown in FIG. 5, a lever 220 is installed in the disc drive 200 to open the elastic protrusions 121 when the disc 130 is completely loaded into the disc drive 200. As the disc cartridge 100 enters the disc drive 200, the lever 220 clashes against front ends of the elastic protrusions 121 as shown in FIG. 6. Thereafter, when the disc cartridge 100 continues entering the disc drive 200, the lever 220 deforms the elastic protrusions 121 to be opened as shown in FIG. 7

Reference numeral 101 denotes openings formed in the upper and lower cases 110 and 120. In the present embodiment, an optical pickup 230 accesses the disc 130 via the openings 101 without an additional shutter.

Reference numeral 241 denotes latches which are latched into dents 123 of the disc cartridge 100 when the disc cartridge 100 goes into the disc drive 200 and thus move inwardly in the disc drive 200, along with the disc cartridge 100. Reference numeral 243 denotes a torsion spring which elastically biases the latches 241 in a direction along which the disc cartridge 100 comes out of the disc drive 200. Reference numeral 242 denotes a loading member which rotates with the movement of the latches 241 to lock or unlock the latches 241. The latches 241, the torsion spring 243, and the loading member 242 are cartridge loading and unloading units generally used in the disc drive 200. In other words, when the disc cartridge 100 goes into the disc drive 200, the latches 241 move with the disc cartridge 100 and then are locked by the loading member 242 so as to fix the disc cartridge 100 at a loading position. Next, when the disc cartridge 100 is pushed one more time in a loading direction, the latches 241 are unlocked by the loading member 242, and thus the disc cartridge 100 springs out of the disc drive 200 due to an elastic restoration force of the torsion spring 243.

In the above-described structure, when the disc 130 placed in the disc cartridge 100 is desired to be loaded into the disc drive 200, the disc cartridge 100 goes into the disc drive 200. Here, as shown in FIG. 4A, the disc 130 is supported by the pair of elastic protrusions 121 and thus slightly lifts up the space 122. However, when the disc cartridge 100 enters the disc drive 200, as shown in FIG. 6, the front ends of the elastic protrusions 121 touche the lever 220. Thereafter, the elastic protrusions 121 grow opened with the entrance of the disc cartridge 100 into the disc drive 200. Accordingly, as the elastic protrusions 121 are opened, the disc 130 slides down the surfaces 121a. As a result, as shown in FIG. 7, the clamp 131 of the disc 130 is chucked to the motor hub 210 when the disc cartridge 100 finishes entering the disc drive 200. Thereafter, recording on and/or reading from the disc 130 are performed when rotating the motor hub 210.

In contrast, when the disc cartridge 100 is pushed toward the disc drive 200 to unload the disc 130 from the disc drive 200, the disc cartridge 100 springs out of the disc drive 200 by the loading and unloading units. Simultaneously, the elastic

protrusions 121 elastically restore to their original positions. The disc 130 then slides up the surfaces 121a and thus lifts up the space 122.

[Effect of the Invention]

As described above, according to the present invention, a disc can slightly lift up in a disc cartridge due to elastic protrusions and then descend to be chucked to a motor hub only when the disc cartridge is completely loaded into a disc drive. As a result, the disc can be prevented from being scratched by the motor hub when the disc is loaded into the disc drive.

While the present invention has been particularly shown and described with reference to an exemplary embodiment thereof, it will be understood by those of ordinary skill in the art that various changes in form and details may be made therein without departing from the spirit and scope of the present invention as defined by the following claims.

What is claimed is:

1. A disc cartridge comprising:

cases that form an internal space to accommodate a disc; and

a pair of elastic protrusions that are formed at both sidewalls of the cases and are elastically biased toward the internal space so that free ends of the elastic protrusions hold the disc,

wherein surfaces are formed at the free ends to slope toward the internal space so that the disc ascends on the surfaces when the pair of elastic protrusions hold the disc and descends on the surfaces when the pair of elastic protrusions are opened.

2. The disc cartridge of claim 1, wherein the elastic protrusions extend from the sidewalls of the cases.

3. A disc drive apparatus loading a disc cartridge comprising cases comprising at least a pair of elastic protrusions extending from sidewalls of the cases to support a disc on sloped surfaces formed at free ends of the elastic protrusions, the disc drive apparatus comprising:

a lever that clashes against the free ends of the elastic protrusions to open the elastic protrusions when the disc cartridge enters the disc drive apparatus, so as to allow the disc to descend on the sloped surfaces.

FIG. 1 (PRIOR ART)

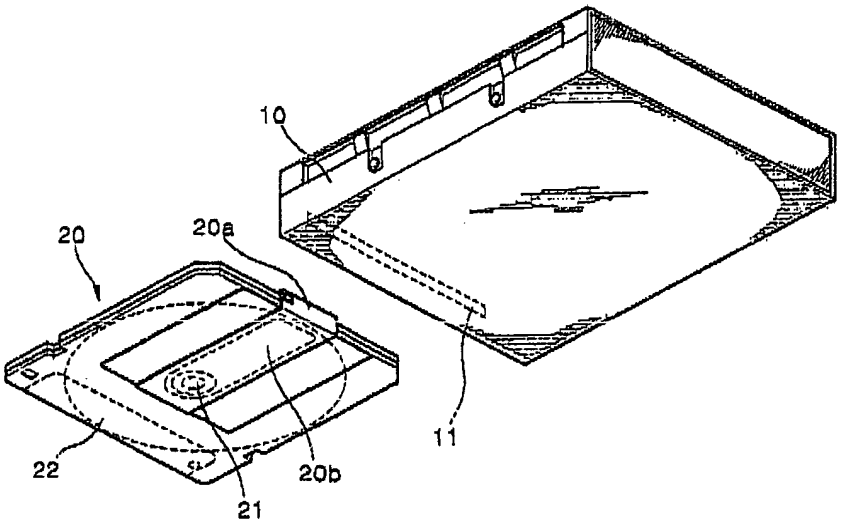


FIG. 2 (PRIOR ART)

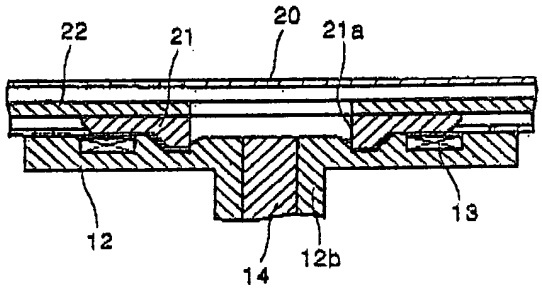


FIG. 3

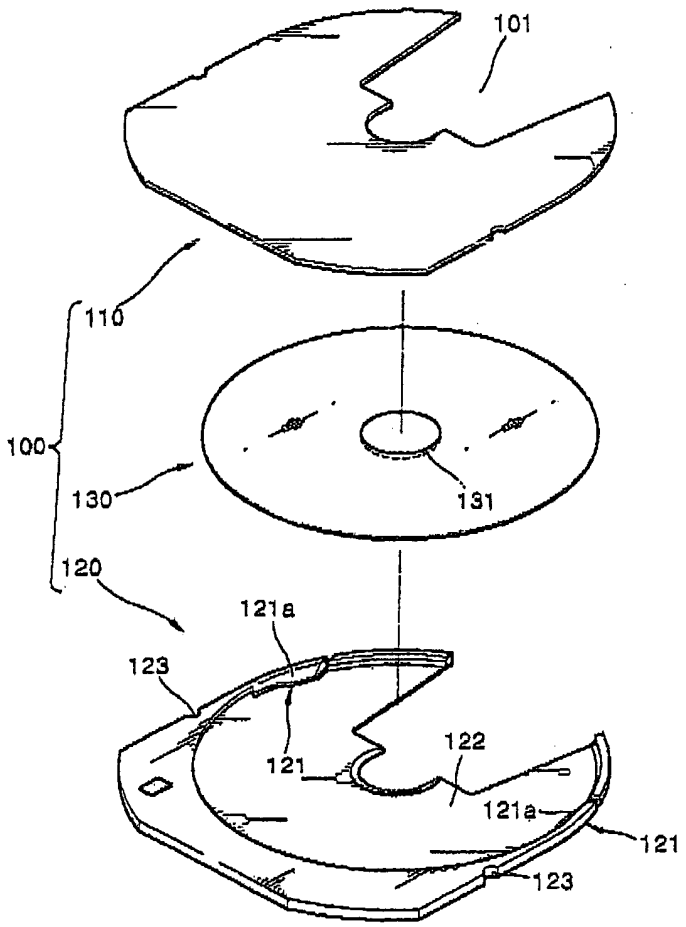


FIG. 4A

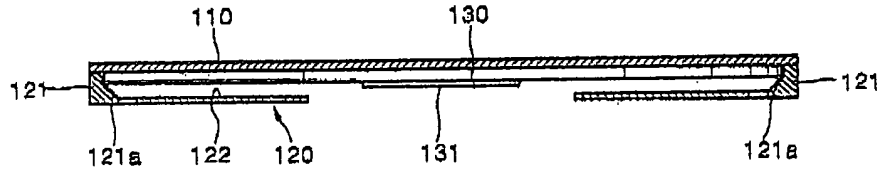

110
130
121
121
121a
122
120
131
121a

FIG. 4B

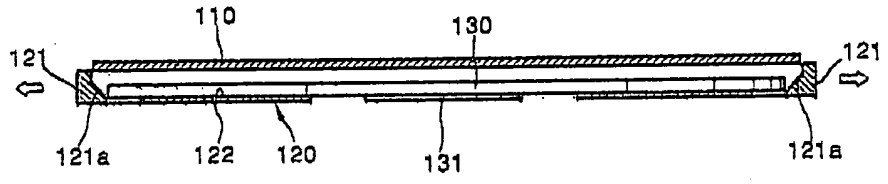

110
130
121
121
121a
122
120
131
121a

FIG. 5

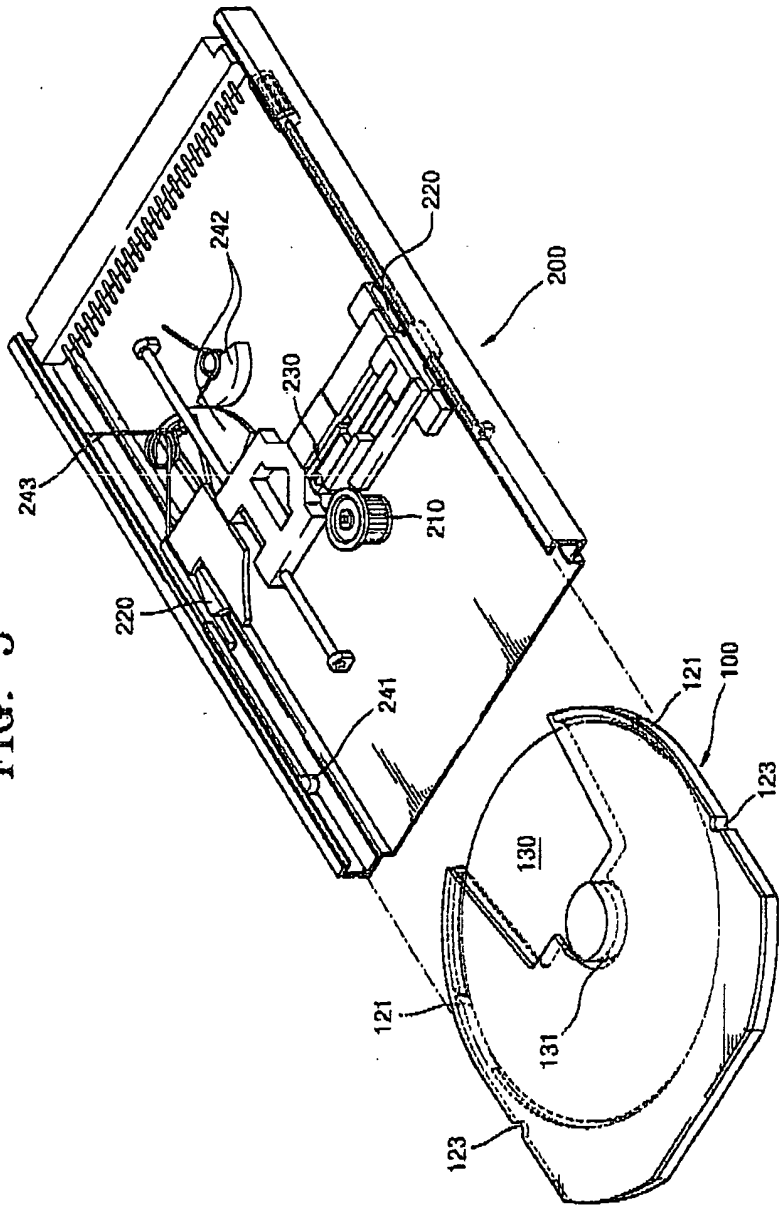


FIG. 6

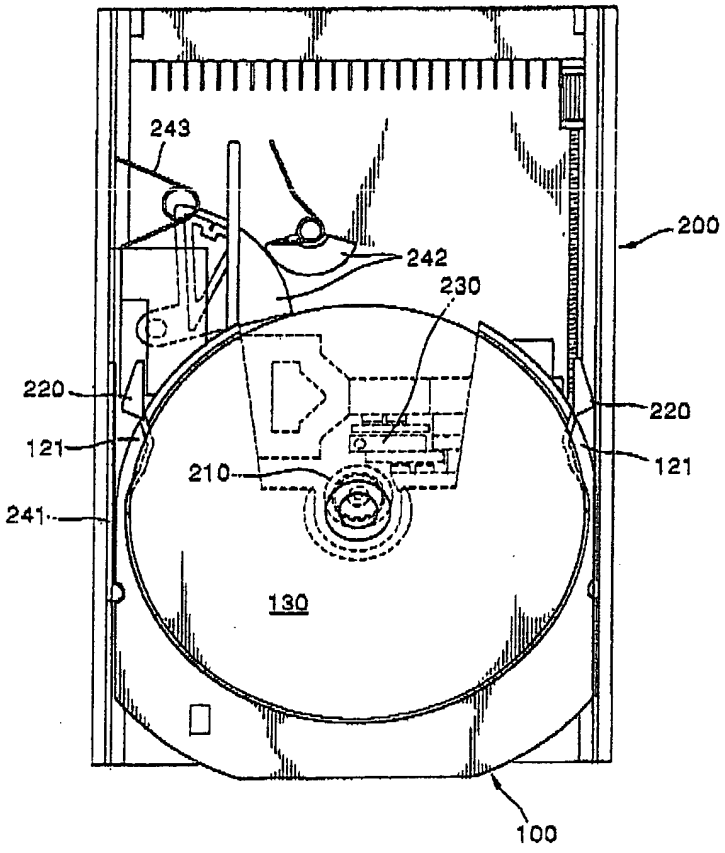
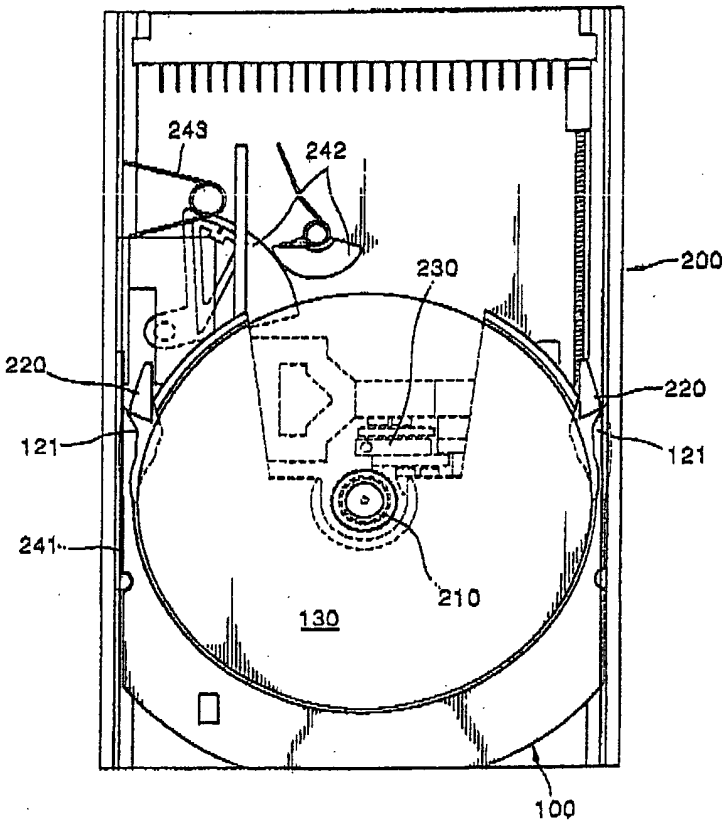


FIG. 7



This Page is Inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.
As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.